

STATE OF IDAHO  
DEPARTMENT OF RECLAMATION

MEMORANDUM

August 18, 1943

Subject Water Measurements in Teton Basin

File \_\_\_\_\_

To Mr. James Spofford  
State Reclamation Engineer  
Boise, Idaho

Dear Mr. Spofford:

In compliance with instructions, on August 2nd I left for Teton Basin to investigate and make a test run of water measurements on Trail Creek and Teton River, for the purpose of determining stream losses on Trail Creek and Teton River.

Arrived at Driggs on the evening of August 3rd, after making several investigations into water troubles on the way; also stopping at Idaho Falls, where information was received, and a discussion was had with Lynn Crandall relative to the Teton Basin investigation.

I also stopped on the way and interviewed Frank Davis, at Mexburg, who is Secretary of the Fremont-Madison Irrigation District.

On the morning of August 4th I met Mr. Oleen Dummer, Deputy Watermaster to Mr. Crandall, who was to assist in making the investigations. Plans had been made to shut off all diversions on Trail Creek for a period of forty-eight hours, beginning on the morning of August 5th, meter the ~~inflow to end~~ of Trail Creek above all diversions, measure all diversions on Trail Creek that were unable to be shut off, and measure Trail Creek at its confluence with live or rising water before it entered the swamp area- thus determining the carriage or seepage loss on Trail Creek.

By measuring Teton River at Tetonia gaging station before and after Trail Creek water was allowed to flow to the river, the loss on the additional water in Teton River could be determined from live water at lower end of Trail Creek to Tetonia gaging station.

On the morning of August 4th Mr. Dummer and myself measured Teton River at Tetonia; from there drove up through the swamp or seeped area as far as Trail Creek, thereby getting a general picture of the seeped area in the Teton Basin

In the afternoon we established a measuring station on Trail Creek, on the border of the seeped area, or at a point where rising water commenced to flow in Trail Creek. The balance of the afternoon was spent in looking over the lower end of the channel on Trail Creek.

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The Trail Creek channel commencing a short way below Victor to rising water was in poor condition for making a test run, it being completely filled up with drift at one point, causing the water to overflow and spread before returning to the original channel below. The area overflowed, however, was not large- probably not over one acre. The balance of the channel was filled with a heavy growth of young willows, grasses, etc., it being necessary to dyke in a few places to confine the water in its original channel or channels.

On the morning of the 5th, in company with Mr. Dummer and the Watermaster of Trail Creek Irrigation Corporation, we commenced about 8:30 A.M. to close all the diversions from Trail Creek, closing the last diversion about 12:00 noon. Due to faulty headgates we were unable to turn all the water back into the creek. However, we turned back all the channel would hold below without overflowing.

We were met shortly after noon by a delegation of men from the Fremont-Madison Irrigation District, of Rexburg, namely Messrs. Nave, Ricks, Walker and Siddoway. These men came up for the purpose of examining the creek channel in the interest of the Irrigation District which they represented.

The balance of the afternoon was taken up in looking over the Trail Creek channel.

In the late afternoon we metered the water in Trail Creek at the beginning of rising water, for the purpose of using the measurement to try to determine whether the water in the creek would increase after a longer period of time, or to be used in comparison with the measurements to be taken the following day.

On the morning of August 6th we started to take a check on the creek to determine the losses. To determine the supply we metered Trail Creek and Game Creek above all diversions; then followed down stream measuring diversions. (Leakage and water which could not be shut off due to faulty headgates.)

Mr. Nave and Mr. Ricks from the Fremont-Madison Irrigation District accompanied us all during the day. At the request of these gentlemen two extra measurements were taken of the water of Trail Creek at points which divided the creek into sections, to determine the loss in each section.

The entire day was taken up in making these measurements, the results of which are as follows:



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Report showing transit loss in water of Trail Creek  
Measurements taken on August 6, 1943, with all diversions closed  
except leakage.

<u>Loss by sections</u>	<u>Computation in second feet</u>
<u>Section 1</u>	
Supply - Trail Creek above String Canal	121.9
Game Creek at Highway	38.1
Total supply above all diversions	<u>160.0</u>
Diversions - String Canal	1.08
Kimball "	1.12
Town "	6.26
Ricks "	.98
Brissler "	3.00
Edwards "	.10
Spencer "	3.56
Humble "	1.24
Tonks "	2.12
McBride "	.80
Total Diversions in section	<u>20.06</u>
Trail Creek below Tonks Canal -	<u>126.54</u>
Total accounted for in section -	<u>146.60</u>
Transit loss in section - - -	13.4
Percent loss in section	8.38 %

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Loss by sections

Computation in second feet

Section 2

Supply below Tonks Canal	126.54
Diversions in section .80	
Trail Creek below Porter Ditch <u>-114.23</u>	
Total accounted for in section	<u>115.03</u>
Transit loss in section - - - - -	11.51
Percent loss in section - - 9.1 %	

Section 3

Supply below Porter Ditch	114.23
Diversions in section .40	
Trail Creek at Livewater <u>85.53</u>	
Total accounted for in section -	<u>85.93</u>
Transit loss in section - - - - -	28.30
Percent loss in section - - 24.77 %	

TOTAL TRANSIT LOSS

Total supply above diversions	160.00
Total Diversions 21.26	
Amount reaching live water <u>85.53</u>	106.79
Total accounted for - - -	<u>53.21</u>
Total transit loss	
Percent loss 33.26 %	

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In trying to determine the loss in river flow from live water at the lower end of Trail Creek to the gaging station on Teton River called Tetonia Gaging Station, two factors were taken into consideration, the average decrease of the stream flow, and the increase rise in flow caused by precipitation during the testing period.

Precipitation records received from the Tetonia Federal weather recording station gave the precipitation as follows: August 1, 0.06 inch; August 2, 0.40 inch; August 4, 0.14 inch; August 6, 0.05 inch, and August 7, 0.06 inch.

The following information and effect of precipitation to the river flow at Tetonia, as given by Mr. Crandall, is as follows:

July 7, 1942- 0.12 inch precipitation raised the river 30 second feet

July 15, 1942 - 0.43 inch precipitation raised the river 77 second feet

August 29, 1942 - 0.08 inch precipitation raised the river 15 second feet

September 11 and 13, 1942 - 1.03 inches of precipitation raised the river 101 second feet

On August 1, 1943, the precipitation was 0.06 inch, and on August 2 the precipitation was 0.40 inch. The precipitation during these two days raised the river approximately 105 24-hour second feet.

On August 6 and 7 the precipitation at Tetonia was given as 0.05 and 0.06 inches, making an accumulation of 0.11 inches of rainfall during the time the test run was being made. This precipitation, plus the Trail Creek water turned into Teton River, - 171 24-hour second feet- raised the river at Tetonia gaging station 235 24-hour second feet.

Allowing for heavier rainfall in the upper end of the basin than that recorded at Tetonia, it still leaves the carriage loss on the Trail Creek water from rising water on Trail Creek to Tetonia gaging station practically nil.

It is logical to assume that the carriage loss through this section of the river would be practically nil, due to the fact that the increased head was only twelve per cent of the total river flow at Tetonia measuring station, and also to the extreme seeped condition of the swamp area through which the river flows.

No measurements were taken to determine river losses on Teton River between Tetonia station and the first diversion on the Lower Teton River. It was the opinion of Mr. Crandall that there was very little loss to the flow through this section of the river.

Respectfully submitted,

ROY W. THOMPSON



AUGUST - 1943

July

Aug.

28 29 30 31

1 2 3 4 5 6 7 8 9 10 11 12

0.01 0.40 0.14 0.08 0.01

Precip.  
at  
Tetonia

24 Hour - Second Feet Discharge - Teton River, Tetonia Station

784 911 938 988 678 930 923 486 678 409 293 961 606 491 615 601

River Raise

Natural Flow + Drop as River

Raise in River caused by Rain.

Precipitation

1943	July	Aug.	Sept.
July 9	15	29	13 + 14
Precipitation	.12	.08	1.03
	30 ft.	10 ft.	43 ft.

800  
700  
600





# COMPARISON WITH OTHER TESTS

## Losses in Trail Creek

Date	Total Flow (Sec. Ft.)	Loss (Sec.Ft.)	Loss (Percentage)
May 2, 1934	94.4	45.1	48 %
May 18	176.9	51.5	29 %
May 31	107.9	34.4	32 %
June 9	80.8	13.1	16 %
" 16	81.3	20.3	25 %
" 24	70.5	21.4	30 %
July 2	60.7	23.1	38 %
" 10	52.5	21.5	41 %
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Aug. 1, 1935	106.8	49.7	47 %
" 17	81.1	37.1	46 %
" 22	78.9	43.6	55 %
" 28	66.9	29.1	44 %
Sept. 5	60.4	25.8	43 %
" 11	54.8	25.1	46 %
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Aug. 7, 1936	88.4	12.4	14 %
June 20, 1939	181.	9	5 Raining
July 1	252	42	17 Water all being
" 20	128	20	16 " " diverted
May 28, 1940	346	27.2	8 " " "
Aug. 28, 1941	72.2	26.4	36
Aug. 24, 1942	67.7	33.2	49
Average			33 %
Aug. 6, 1943	160.0	53.21	33.26 %

## Losses thru Swamps between live water on Trail Creek and Tetonia Station

Date	Raise at live water on Trail Cr. (Sec. Ft.)	Raise reaching Tetonia Station (Sec.Ft.)	Loss (Sec.Ft.)	%
May 18, 1934	105	74	31	30 %
May 31 "	67.6	30	37.6	56 %
June 9 "	62	35	27	43 %
June 16 "	55	37	18	33 %
June 24 "	41.2	28	13.2	32 %
July 2 "	29.8	16	13.8	46 %
July 10 "	22.6	10	12.6	56 %
Average			12.6	42 %
Aug. 7-9, 1943	85.53	85.53	--	--

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September 1, 1943

Subject Teton Basin Investigation

File \_\_\_\_\_

Left Boise August 22nd for Teton Basin, with the expectation of making a second test run of water measurements for determining stream losses on Trail Creek and Teton River. Stream losses to be taken on water which is now being diverted from Trail Creek, by turning same back into the stream and allowing it to flow into Teton River.

Arrived in Driggs on the afternoon of the 23rd, where I was met by Mr. Goslin, Deputy Watermaster under Mr. Crandall; together we drove to Victor where we interviewed Mr. Gillette, relative to closing all diversions on Trail Creek for a period of forty-eight hours.

Our plan was favorable with Mr. Gillette; however, it was decided that before proceeding further with our plans we should have the consent of the majority of the officials of the major ditch companies. The next day was spent in interviewing these men, where we met strenuous opposition to turning the water off for a second test run.

The waters of Trail Creek are being rotated by the various canal companies and water users, and the continuous use of water without interruption is very essential to the growing, maturing and saving of crops at this time; therefore, it was the decision of all directors on the boards of the various canal companies that the water could not be turned off for another test run at this time.

The following is a list of names of officials contacted and interviewed, also some of the important sentiments expressed during our conversation:

HOWARD TONKS, President Trail Creek Irrigation Co.: Not in favor of shutting off water at this time. Says water is vital to the maturing of crops at this time. Thinks other test run was fair and should be acceptable; does not think Teton River between live water on Trail Creek and Tetonia Station should show a loss on additional Trail Creek water with present river and ground waters conditions.

Relative to the percentage of exchange between storage water and natural flow, he thinks the 1-3/4 to 1 ratio as good as can be expected and would be acceptable to all upper water users.



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VAN DUSTIN, Director, Trail Creek Irrigation Company: States that water should not be taken from the water users at this time, and not in favor of making another test run at this time, and does not think it necessary to make another test.

Relative to storage water, thinks 1-3/4 to 1 as good as they can expect.

DELOSS LAURITZEN, Merchant at Victor, Director of Trail Creek Irrigation District: Very set against turning water off for making test run; does not think it would do any good, or is necessary; satisfied with first test, if used with other tests, for average losses

Thinks upper users should receive exchange water on a 60 - 40 basis; however, wants to be fair with lower users.

GEORGE RUST, President String Canal Company: Doesn't care whether another test run is made or not on Trail Creek waters. Says he is satisfied with tests already run. Thinks upper users should have a 2 to 1 ratio on exchange storage water. However, to get things settled, thinks 1-3/4 to 1 as good as can be expected; very anxious to sign an agreement and have things settled. Does not agree with Gillette on water problems. Says Gillette was instrumental in putting more new land under cultivation on the gravel bar on north side of Trail Creek, which was to be watered by flood and storage water, but actually takes water from old decreed rights.

R. C. BLANCHARD, Director String Canal Company: Thinks exchange of storage water should be on a 2 to 1 basis; However, to get things settled would be willing to close deal on a 1-3/4 to 1 basis. Not in favor of turning water off for another test run; states that it would injure crops to quite an extent. Thinks first test was fair and satisfied that Teton River between rising water on Trail Creek and Tetonia measuring station should not show much loss on additional water turned down from Trail Creek.

MR. MURDOCK, Director String Canal Company: Seems to be very fair- would like to see things settled as soon as possible; thinks ground water and return flow should be taken into consideration. However, thinks 1-3/4 to 1 fair basis for exchange on storage water. Not in favor of making another test run at this time; if necessary to make another test, it should not be made before September 15.

ORLO JOHNSON, Director Trail Creek Irrigation Company: Not in favor of having water turned off; satisfied with previous test run if averaged with other test runs. Thinks return flow should be taken into consideration when arriving on an exchange basis for storage water, and that the upper users should have more than a 1-3/4 to 1 ratio.

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N. H. WHITE, President Garden Water Company: Thinks 1-3/4 to 1 fair basis for exchange for storage water. Would like to see things settled as soon as possible between the upper and lower water users.

VIRGIL PENFOLD, Director Garden Water Company: Ex-Senator or representative from Teton County, also ex-Deputy Watermaster on Upper Teton River: Says when the tests were made water users on Trail Creek tried to defeat the purpose by turning water out while tests were being made, and lower water users found it out. With his experience as watermaster on upper river, he thinks 1-3/4 to 1 a fair basis for both sides, and thinks if upper users can get that, they will be lucky; says that it was unfortunate for upper users to stir things up at this time.

L. W. HASTINGS, Clerk of District Court, Teton County: Mr. Hastings has large property holdings, mostly interested in waters from Teton Creek.

Thinks 1-3/4 to 1 fair basis for exchange for storage water- thinks return flow should be given consideration. Thinks water users of upper valley should be fair, and co-operate with lower users, and thinks that they will, if given a fair chance. Thinks this year's test run fair, but should be considered on an average with other tests taken in other years.

Is willing to let Mr. Spefford settle the thing, once and for all.

MR. F. C. GILLETTE: After explaining in detail to Mr. Gillette regarding the last test run made, pointing out that limitations were made whereby precipitation was taken into account in arriving at river channel losses, and explaining the differences in river loss which there would naturally be during an abnormal year such as 1943, compared to losses in dryer years when other tests were made; and after hearing the opinions of other water users on Trail Creek, he apparently was convinced that another test run was not so important; However, it was left that if they thought it necessary, they would request another run around September 15th.

Respectfully submitted,

ROY W. THOMPSON  
Supervisor of Water Distribution